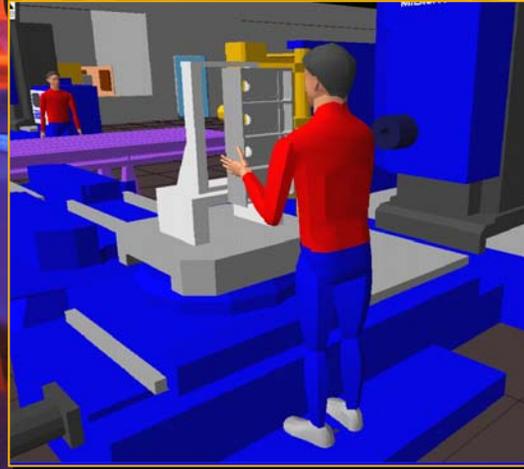


# Manufacturing Engineering

at the  
National Institute  
of Standards and  
Technology

Roadmap for  
Integrated Modeling  
& Simulation for  
Emergency  
Response

Dale Hall  
Director



**NIST**

National Institute of Standards and Technology  
Technology Administration, U.S. Department of Commerce

# National Institute of Standards and Technology

Our Mission: Develop and promote measurement, standards, and technology to enhance productivity, facilitate trade, and improve the quality of life.

**NIST carries out its mission through a portfolio of four programs....**



**Laboratories**



**Baldrige  
National  
Quality Program**



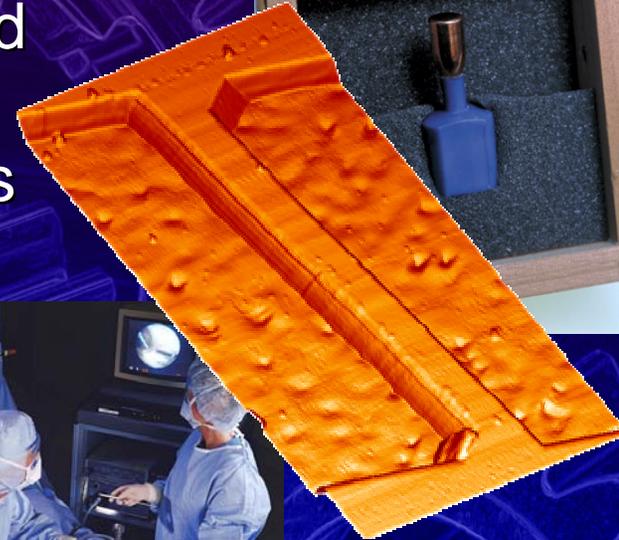
**Manufacturing  
Extension  
Partnership**



**Advanced  
Technology  
Program**

# NIST Strategic Plan

- Opportunities for special focus and growth through new initiatives
- Agency-wide strategic focus areas
  - **Homeland Security**
  - **Nanotechnology**
  - **Information and Knowledge Management**
  - **Health-care**
- Strong support for established manufacturing customers
  - Agency-wide **Manufacturing Strategic Working Group** being formed
- Leadership in metrology and standards
- Exploration of new technology areas



# NIST Laboratories

**Manufacturing Engineering**



**Building and Fire Research**



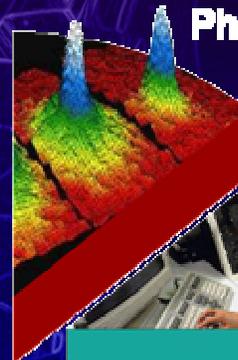
**Chemical Science and Technology**



**Materials Science and Engineering**



**Physics**



**Information Technology**



**Technology Services**

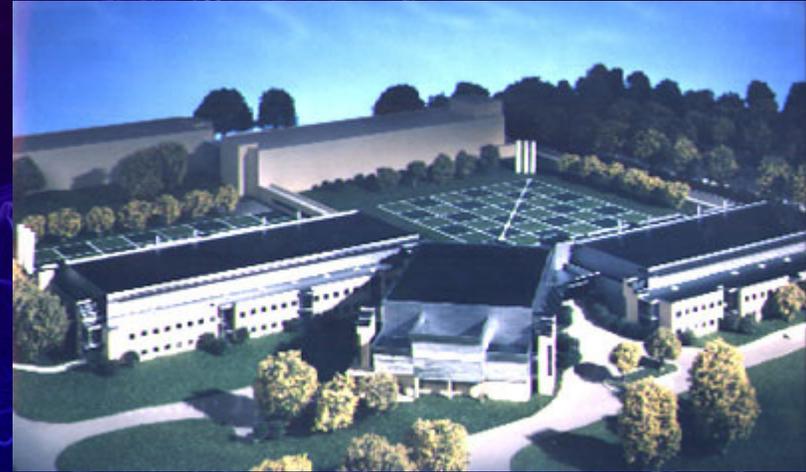


**Electronics and Electrical Engineering**

- Measurement Research and Methods
- Calibration Services and Tests
- Standard Reference Data and Materials
- Standards Development
- Industrial Technologies
- Laboratory Accreditation

# NIST Advanced Measurement Laboratory (AML)

- World-leading laboratory facilities in air quality and temperature, vibration, humidity control – critical for MEL precision measurement capabilities
- 27 of 41 MEL measurement service areas to move into AML, 57 major equipment items
- MEL moving during 2<sup>nd</sup> and 3<sup>rd</sup> quarters of 2004



# U.S. Economy Depends on NIST Measurements

## Basic Units

Maintained by NIST

## Derived Units

Maintained by NIST

## Standards & Calibrations

Traceable to NIST

## Applications

- Time
- Length
- Mass
- Temperature
- Electric current
- Light intensity
- Amount of substance (mole)
- Frequency
- Diameter
- Volume
- Acceleration
- Density
- Force
- Pressure
- Voltage
- Radiation
- Global time service
- Laser frequency
- Gage blocks
- Line standards
- Radioactivity
- Electrical quantities
- Reference materials and data
- Telecommunications
- Computer "chips"
- Pharmaceuticals
- Medical imagers
- Gasoline pumps
- Digital clocks
- TV signals
- CD-Roms
- Aircraft...

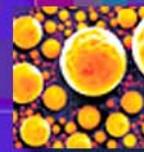


# Partnering with NIST



- Cooperative Research and Development Agreements (CRADAs)
- Contracts
- Guest Researchers
- Memoranda of Understanding and Letters of Agreement
- Grants
- SBIR
- National Research Council Post-Doctoral Research Associates
- Summer Students
- Summer Undergraduate Research Fellowships (SURF)
- Sabbatical
- others

**Manufacturing Engineering  
Laboratory**



**NIST**  
National Institute of  
Standards and Technology



Promoting a healthy U.S. manufacturing economy by solving tomorrow's measurement and standards problems today

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